National Laboratory of the Rockies

# REQUEST FOR INFORMATION (RFI)

## Pilot-Scale Membrane Research Line

## RFI-2026031392

## Date of Issuance: August 5, 2026

## Response Deadline: September 3, 2026, 5:00PM, Mountain Time

### *1.0 Background*

The National Laboratory of the Rockies (NLR) is the U.S. Department of Energy's primary national laboratory for energy systems research and development. As the energy systems laboratory, NLR's unique strength lies in developing and integrating a broad array of energy technologies into robust, resilient systems - bridging foundational research with practical applications to lower energy costs, drive economic growth, bolster national security, and deliver abundant and reliable energy.

This is a Request for Information (RFI) issued by the Alliance for Energy Innovation, LLC. The purpose of this RFI is to conduct market research and gather information on the current capabilities of potential sources to provide Pilot-Scale Membrane Research Line.

The membrane sector needs flexible, accessible manufacturing equipment to research and develop membrane production processes at scale. NLR will establish a national research facility to address scale-up and manufacturing challenges and enable cost-effective fabrication of innovative membranes for a variety of separations processes. NLR's goal is to establish a R&D center focused on enabling a more competitive U.S. industrial sector through creation of national laboratory capabilities that address R&D challenges in membrane development and production. A key piece of this center is a pilot-scale, flat sheet (roll-to-roll) membrane production line capable of producing a broad range of separations membranes. The purpose of this line will be to conduct research, process development, optimization, and small-scale pilot production. NLR seeks a unique fabrication line that offers unparalleled flexibility in its modularity of unit operations and ability to fabricate membranes for a variety of applications.

### *2.0 Scope of Need*

The information received in response to this RFI will guide Alliance's focus for writing a requirements document to meet our overall research goals. NLR is seeking information from sources that may be capable of providing a solution to the following:

To design and build roll-to-roll line capable of producing a broad range of membranes at widths up to 42 inches. NLR desires to acquire a line with capability to produce thin film composite, asymmetric, hybrid, and dense membranes. The purpose of this line is to provide a research platform to advance low-technology/manufacturing-readiness-level technologies. This equipment will be a research tool for a variety of industrial, federal, and academic partners. Given the expected breadth of partners and applications the line should prioritize flexibility; modularity of unit processes; and instrumentation and data collection. The information received in response to this RFI will guide NLR's focus for writing a requirements document to meet our overall research goals. The project objective, at a high level, is to collect specifications required to design and commission a membrane research line.

In the event a solicitation is released, NLR is seeking information from sources that may be capable of providing a solution that meets or exceeds the following minimum capabilities:

1. 42-inch-wide coating/casting
2. Maximum line length: 70-75 ft
3. Multiple baths or rinse tanks for phase inversion, solvent extraction, and chemical treatment processes. Baths should include recirculation, temperature control, and automatic filling/draining capability.
4. Four 12-foot oven zones (electric)
5. Two coating stations with capability for multiple coating modalities (e.g. slot, knife, dip, gravure)
6. Infrared heater zone following coating stations. Position of IR unit should be movable within a roughly 10 ft-long section.
7. Splice table
8. Interleaf peal and feed at unwind and rewind
9. Bidirectional winding and unwinding
10. Web steering
11. Secondary coating station (after ovens and baths) followed by 12 ft oven zone (electric)
12. Tension control suitable for handling web materials including dense polymer films (thickness 25 – 150 µm), non-woven supports (e.g.

## 3.0 Information Requested from Respondents

Please structure your response to address the following areas. This information will help us understand your ability to meet our potential needs.

### 3.1. Company Information

- Company Name, Address, and Website URL.
- Point of Contact (Name, Title, Email, and Phone Number).
- Company Overview (briefly describe your company, its size, and core competencies).
- Socio-Economic Status (e.g., Small Business, Woman-Owned, Veteran-Owned, 8(a), HUBZone, etc.) under the specified NAICS code.

### 3.2. Technical/Solution Approach

- Based on the "Scope of Need" in Section 2.0, describe your proposed solution, product, or methodology.

### 3.3. Pricing

- Provide a Rough Order of Magnitude (ROM) price estimate for your solution.
    - Note: ROM information is for budgetary and planning purposes only and does not constitute a formal bid or offer.

### 3.4. Key Questions and Technical Challenges

Key Questions:

NLR is interested in the following information to maximize relevance and value:

1. How practical is it to build a multi-technology membrane line where different process units can be utilized depending on the web path or reconfiguration of the process units?
2. What is the line's ability to support the integration of an array of sensors and analytical measurement tools, either as part of the original design or as retrofitted additions at a later date?
3. What is your specific experience in designing and building equipment for membrane R&D and/or commercial production?
4. What ranges of line tension are available on this equipment?
5. What is the potential for implementing a human-machine interface (HMI) capable of automatically sensing machine configurations and various unit process modules?
6. What are the available ranges for oven temperatures and airflow rates, and what are the associated power and utility requirements?
7. Can you describe the compatibility of the bath materials available with acids, bases, organic solvents, and salt solutions?
8. Which coating modalities are available with your system(s) (e.g. slot, knife, dip, gravure, etc...)?
9. Are you able to provide a fluid delivery system designed to support these coating and casting operations?
10. What would be an estimate for the overall size of the system?
11. Can you provide a high-level description of the safety features incorporated into the system and what outputs are available?

Example Technical Challenges:

A description of example technical challenges, with potential associated research and validation[1] applications to address them, is included below. These examples are not exhaustive and are intended to only provide a starting point:

- The planned installed location for this equipment will be in a high-bay facility at NLR in Golden, CO. Based on the floorplan of the facility, the maximum length of the equipment is 70 – 75 ft. Space for operators and egress will be in addition to this length and do not need to be considered in the line length calculation. The width of the equipment is not constrained.

- NLR would like this line to be capable of producing serval types of membranes (i thin-film composites, asymmetric, hybrid and dense membranes) by coating fluids (water-based, solvent-based, or liquid monomer) onto various flexible substrates. Fabrication of different types of membranes require different process units and/or different arrangements of process units. The technical challenge will be to design a line that can ensure flexibility to meet fabrication requirements for different technologies. This could either be by designing a line where process units are moveable and can be arranged and rearranged as needed. Alternatively, the units could be arranged in fixed positions, but a variety of web path options enable units to be used in different arrangements.
- The system may need to be able to handle substrates with varying physical and mechanical properties, whether by a single tension control and web path system that minimizes web-handling defects across the broadest range of substrates, or by a tension control system with parts that can be swapped/adjusted to suit varying substrate needs. Likely substrates in polymer-fiber non-wovens and polymer films.

## 4.0 Submission and Administration Instructions

- **Response Deadline:** All responses must be received by September 3, 2026 at 5:00PM, Mountain Time. Late responses may not be considered.
- **Format:** Responses should be submitted as a **PDF**. Please limit your response to **2-5 pages**, not including a cover page.
- **Method of Submission:** Responses must be submitted electronically to the following email address: ASP.Responses@nlr.gov.
    - The subject line should read: **RFI-2026031392: [Your Company Name]**
- **Small-Business Requirements:** Sufficient, qualified responses to this RFI will determine if a total small business set aside is appropriate for a resultant RFP. The NAICS code applicable to this RFI is **333248 All Other Industrial Machinery Manufacturing**. Links for convenience:
    - https://www.sba.gov/document/support--table-size-standards
    - https://www.sba.gov/size-standards
- **Estimated Lead Time**: for Implementation/Delivery to NREL

***Disclaimer:*** Responding to this request identifies your company as an interested candidate only. Your submittal is not in response to a Request for Proposals (RFP). This is an RFI, not a Request for Proposal. All responses must be in writing via email and verbal replies will not be accepted. Project related questions or inquiries related to this posting will not be entertained at this point in the procurement process. Status of this posting or any action related to this posting thereafter will not be entertained. This document represents a market research effort. Any costs associated with the development of a response to this request will not be reimbursed by Alliance and submission does not guarantee or otherwise promise inclusion in any forthcoming RFP. In the event a solicitation results from this RFI, Alliance reserves the right to set aside in total or in part any resultant award. Should the Alliance elect not to proceed with a further solicitation, Alliance may or may not notify respondents of this decision.